

File E156996  
Project 93ME39941,

Issued: November 29, 1993  
New: April 26, 2006

REPORT

On

COMPONENT - POWER SUPPLIES

For Use In

INFORMATION TECHNOLOGY EQUIPMENT

**Vicor Corp.**  
**Andover, MA**

Copyright © 1993, Underwriters Laboratories Inc.

Underwriters Laboratories Inc. authorizes the above-named company to reproduce this Report provided it is reproduced in its entirety.

Underwriters Laboratories Inc. authorizes the above-named company to reproduce that portion of this Report consisting of this Cover Page through Page 3.

## D E S C R I P T I O N

## PRODUCT COVERED:

USR, CNR - Component - Power Supply, 4KW MegaPAC Series: , and Three Phase MegaPAC Series: Mpa-a-zbbcccc-dd-v-xx. Breakdown is as follows: , MP may be replaced by IMP.

\*

- Item 0.      MegaPAC Type  
            z = 4 for 4KW MegaPAC  
            z = 5 for 3 PH MegaPAC
- Item 1.      Module Configuration  
            p = P when populated with 1<sup>st</sup> Gen Vicor Modules  
            p = X when populated with 2<sup>nd</sup> Gen or a combination of 1<sup>st</sup> and 2<sup>nd</sup>  
            Gen Vicor Modules
- Item 2.      Number of Outputs  
            aa = any number 0 - 20
- Item 3.      Number of Modules  
            bb = any number 0 - 20
- Item 4.      Factory assigned Code (Non-safety related)  
            cccccc = any alphanumeric combination of up to 6 characters or blanks
- Item 5.      Module slot identification Code (Optional, Non-safety related)  
            dd = any alphanumeric combination of up to 2 characters or blanks
- Item 6.      MegaPAC configuration Revision (Optional)  
            v = any alphanumeric character or blank (note: v = G for RoHS compliant)
- Item 7.      MegaPAC description (Optional)  
            xx = any alphanumeric combination or blanks  
            (note: xx = EL for extended length)  
            (note: xx = LL for low leakage)

\*

## GENERAL CHARACTER AND USE:

The Converter's PAC Three Phase MegaPAC is built using up to twenty Recognized (QQQ2) dc-dc converters, which consist of the ten maximum, Recognized (QQQ2) slide-in Modules. The outputs can be configured by selecting the desired outputs voltage of the module and paralleling of similar outputs to provide the output configurations described in the Rating Section of this report. All units share the same front end primary circuitry and fan cooling/over temperature protection circuitry.

The power supplies were investigated for compliance with the Standard for Information Technology Equipment Including Electrical Business Equipment, UL 60950-1:2003, First Edition, CAN/CSA C22.2 No. 60950-1-03, First Ed.

## ELECTRICAL RATINGS:

Input - 3 phase Series: 200-240 V ac or 208/230 V ac, 47-500 Hz, 0-20 A max per phase or 300 V dc, 0-20 A, applied between two phases.

Output - Output voltage and power are given for each output. Each output voltage is in range 2-95 V dc. The maximum total output power is 2000 W, with Converter PAC's using VI-x6x-xx or IP-x6x-xx Series DC-DC Converters. The maximum total output power is 4000 W with Converter PACs using Viiiisxxyzzzw Series DC-DC converters.

The 2kW output, 3 phase MegaPAC only uses VI-x6x-xx IP-x6x-xx Series modules. The 4kW output, 3 phase MegaPAC only uses Viiiisxxyzzzw series modules. The outputs of these modules between 2-40 V only have been evaluated as SELV.

The max output power for an individual Viiiisxxyzzzw Series DC-DC converter is 400 W. The max outpower for an individual VI-26x-xx, IP-26x-xx or VI-B6x-xx, IP-B6x-xx Series dc-dc converter with output voltage 2-95 V dc is 200 W. The max output power for a VI-J6x-xx or IP-J6 Series is 100 W. The max output power for parallel converters is the sum of their individual output power. The nominal input voltage for the VI-26x-xx, IP-26x-xx, VI-B6x-xx, IP-B6x-xx, VI-J6x-xx and IP-J6x-xx is 300 V dc.

## MODEL DIFFERENCES:

The model number may be followed by additional letters and/or numbers, as described in the product covered paragraph which signifies the variations.

The DC MegaPAC Series is constructed identically to the Three Phase MegaPac Series. The Markings of the DC Series directs the installer to connect the DC potential between two of the existing phases, and to terminate the unused phase.

## ENGINEERING CONSIDERATIONS (NOT FOR UL REPRESENTATIVE USE):

Use - For use only in end-use equipment where the acceptability of the combination is determined by Underwriters Laboratories Inc.

Special Considerations - The following items are considerations that were used when evaluating this product.

**USR/CNR indicates investigation to the U.S. and Canadian (Bi-National) Standard for Safety of Information Technology Equipment, Including Electrical Business Equipment, UL 60950-1:2003, First Edition, CAN/CSA C22.2 No. 60950-1-03, First Ed.**

Conditions of Acceptability - When installed in the end-use equipment, the following are among the considerations to be made.

1. **This component has been judged on the basis of the required spacings in the UL 60950-1:2003, First Edition, CAN/CSA C22.2 No. 60950-1-03, First Ed., Sub. Clause 2.10, which would cover the component itself, if submitted for Listing.**

1A. "Models without ConverterPAC's ("0" outputs) Fig. 1, Item 4, are provided with Blank (filler) panels. These units are NON-SELV, non-Isolating, NON-Functional and require the ConverterPAC's to provide primary to secondary isolation."

2. The power supply should be installed in compliance with the enclosure, mounting, spacing (creepage and clearance), casualty, markings and segregation requirements of the end-use application.

3. The need for conducting leakage current tests is to be determined as part of the end-product evaluation.

4. This power supply has only been evaluated for use in a pollution degree 2 environment.

5. A Heating Test should be conducted in the end-product. Consideration should be given to measuring the temperature on power electronic components, inductors and transformer windings when the power supply is installed in the end-use equipment. All transformers employ a Class A electrical insulation system.

6. The input and output connectors have not been evaluated for field connections and are only intended for connection to mating connectors of internal wiring inside the end-use machine. The acceptability of these and the mating connectors relative to secureness, insulating materials, and temperature shall be considered.

7. This power supply shall be properly bonded to earth in the end-use product as this unit was investigated for Class I construction. The bonding terminal has not been investigated as a protective earthing terminal. An additional evaluation shall be made if the power supply is intended for use in other than Class I equipment.

**7a. The need for conducting an earthing tests is to be determined as part of the end-product evaluation.**

8. This power supply has only been evaluated for use in a 25°C ambient. An additional evaluation should be made if the power supply is intended to be used in an elevated ambient.

9. Three 20 A fast-blow fuses were provided in each input phase. These fuses were relied on for Component Abnormal testing. Consideration should be given to repeat these tests if any other rated fuse is used.

10. A Locked Rotor Test was performed on the fan. Consideration should be given to the fan guard if it acts as part of the end-product enclosure.

11. These units may be shipped with 1 to 10 ConverterPACs. This investigation was based on these units being installed within an overall enclosure which is not operator accessible. If, in the end-use equipment these power supplies are to be operator accessible, consideration should be given to the accessibility and possible energy hazard available at any unused modupac module connectors.

12. The individual modules which comprise this unit have earth leakage currents which may exceed 3.5 mA at high frequency inputs. For end-product units which operate at input frequencies higher than 63 Hz, the end-product must be provided with industrial type sockets or plugs, and the cross-sectional area of the internal protective earthing conductor may not be less than 1.02 mm, or the end-product must be additionally evaluated to determine acceptability with respect to leakage current requirements.

13. During testing of the MegaPAC Series, the unit's chassis was connected to ground. The inputs and outputs were isolated from ground.

14. The input of the DC MegaPac Series should be provided with an appropriate current rated 300 V dc over-current protection device.